Chapter 14

Configure Channelized STM-1 Interfaces

You can configure up to 63 E1 channels per single-port Channelized STM-1 to E1 PIC. To specify the channel number, include it after the colon (:) in the interface name. For example, a Channelized STM-1 to E1 PIC in FPC 1 and slot 1 will have the following physical interface, depending on the media type:

e1-1/1/0:*x*

The E1 channel number can be from 0 through 62.

This chapter is organized as follows:

Configure Channelized STM-1 Interface Properties

To configure the interface properties for Channelized STM-1 to E1 PICs, you include the e1-options and sonet-options statements for both sides of the connection. The following configurations list all the valid statements.

To specify options for each of the E1 channels on the Channelized STM-1 to E1 PIC, include the e1-options statement at the [edit interfaces *interface-name*] hierarchy level:

```
[edit interfaces interface-name]
e1-options {
    bert-error-rate;
    bert-period;
    fcs (32 | 16);
    framing (g704 | g704-no-crc4 | unframed);
    idle-cycle-flag (flags | ones);
    loopback (local | remote);
    start-end-flag (shared | filler);
    timeslots time-slot-number;
}
```

When a channelized STM-1 interface experiences a line transition, the E1 channels configured in unframed mode log a large number of drops (around 24,000) as the channelized STM-1 interface clocks resynchronize. This does not occur on framed channels, because the framing resynchronizes clocks very quickly.

To specify options for the SONET/SDH side of the connection, include the sonet-options statement at the [edit interfaces *interface-name*] hierarchy level:

```
[edit interfaces interface-name]
sonet-options {
    bytes {
        e1-quiet value;
        f1 value;
        f2 value;
        s1 value;
        z3 value;
        z4 value;
    }
    loopback (local | remote);
}
```

On Channelized STM-1 interfaces, you should configure the clock source on one side of the connection to be internal (the default JUNOS configuration) and on the other side of the connection to be external.

By default, original Channelized T3 and STM-1 interfaces can support a maximum of 64 Frame Relay data-link connection identifiers (DLCIs), numbered 0 through 63, per channel. In DLCI sparse mode, original Channelized T3 and STM-1 interfaces support a maximum of three DLCIs, numbered 0 through 1,022, per channel. DLCI 0 is reserved for LMI. You configure the router to use DLCI sparse mode by including the sparse-dlcis statement at the [edit chassis fpc *slot-number* pic *pic-number*] hierarchy level. Channelized T3 QPP interfaces support a maximum of 64 DLCIs, numbered 0 through 1,022, and, therefore, do not require sparse mode. For more information about Frame Relay DLCIs, see “Configure a Point-to-Point Frame Relay Connection” on page 266. For more information about DLCI sparse mode, see the *JUNOS Internet Software Configuration Guide: Getting Started*.

For more information about specific statements, see “Configure E1 Interfaces” on page 207, “Configure SONET/SDH Interfaces” on page 293, and “Configure T1 Interfaces” on page 319. For a configuration example, see “Example: Configure Channelized STM-1 Interfaces” on page 183.

Virtual Tributary Mapping of Channelized STM-1 Interface

You can configure virtual tributary mapping to use KLM mode or ITU-T mode. To configure virtual tributary mapping, include the vtmapping statement at the [edit chassis fpc *slot-number* pic *pic-number*] hierarchy level:

```
[edit chassis fpc slot-number pic pic-number]
vtmapping (klm | itu-t);
```

By default, virtual tributary mapping uses KLM mode. For more information, see the *JUNOS Internet Softw are Configur ation Guide: Getting St arted*.

Table 19 lists the KLM mappings used by the Channelized STM-1 to E1 PIC interfaces. The PIC defaults to KLM numbering with an offset of –1; for example, KLM 1 = STM-1 PIC 0.

Table 19: Channelized STM-1 to E1 Channel Mapping

Channel Number	KLM Number	Tributary Unit Group 3	Tributary Unit Group 2	Virtual Tributary	ITU-T Number
0	1	1	1	1	1
1	2	1	1	2	22
2	3	1	1	3	43
3	4	1	2	1	4
4	5	1	2	2	25
5	6	1	2	3	46
6	7	1	3	1	7
7	8	1	3	2	28
8	9	1	3	3	49
9	10	1	4	1	10
10	11	1	4	2	31
11	12	1	4	3	52
12	13	1	5	1	13
13	14	1	5	2	34
14	15	1	5	3	55
15	16	1	6	1	16
16	17	1	6	2	37
17	18	1	6	3	58
18	19	1	7	1	19
19	20	1	7	2	40
20	21	1	7	3	61
21	22	2	1	1	2
22	23	2	1	2	23
23	24	2	1	3	44
24	25	2	2	1	5
25	26	2	2	2	26
26	27	2	2	3	47
27	28	2	3	1	8
28	29	2	3	2	29

Channel Number	KLM Number	Tributary Unit Group 3	Tributary Unit Group 2	Virtual Tributary	ITU-T Number
29	30	2	3	3	50
30	31	2	4	1	11
31	32	2	4	2	32
32	33	2	4	3	53
33	34	2	5	1	14
34	35	2	5	2	35
35	36	2	5	3	56
36	37	2	6	1	17
37	38	2	6	2	38
38	39	2	6	3	59
39	40	2	7	1	20
40	41	2	7	2	41
41	42	2	7	3	62
42	43	3	1	1	3
43	44	3	1	2	24
44	45	3	1	3	45
45	46	3	2	1	6
46	47	3	2	2	27
47	48	3	2	3	48
48	49	3	3	1	9
49	50	3	3	2	30
50	51	3	3	3	51
51	52	3	4	1	12
52	53	3	4	2	33
53	54	3	4	3	54
54	55	3	5	1	15
55	56	3	5	2	36
56	57	3	5	3	57
57	58	3	6	1	18
58	59	3	6	2	39
59	60	3	6	3	60
60	61	3	7	1	21
61	62	3	7	2	42
62	63	3	7	3	63

Example: Configure Channelized STM-1 Interfaces

The following configuration is sufficient to get the Channelized STM-1 to E1 PIC interface up and running. The Channelized STM-1 to E1 interface is an STM-1 that is divided into 63 E1 interfaces. E1 interfaces can use the following encapsulation types:

PPP, PPP CCC, and PPP TCC

Frame Relay, Frame Relay CCC, and Frame Relay TCC

Cisco HDLC, Cisco HDLC CCC, and Cisco HDLC TCC

The channels can also have logical interfaces. By default, original Channelized T3 and STM-1 interfaces can support a maximum of 64 Frame Relay data-link connection identifiers (DLCIs), numbered 0 through 63, per channel. In DLCI sparse mode, original Channelized T3 and STM-1 interfaces support a maximum of three DLCIs, numbered 0 through 1,022, per channel. DLCI 0 is reserved for LMI. You configure the router to use DLCI sparse mode by including the sparse-dlcis statement at the [edit chassis fpc *slot-number* pic *pic-number*] hierarchy level. Channelized T3 QPP interfaces support a maximum of 64 DLCIs, numbered 0 through 1,022, and, therefore, do not require sparse mode. For more information about Frame Relay DLCIs, see “Configure a Point-to-Point Frame Relay Connection” on page 266. For more information about DLCI sparse mode, see the *JUNOS Internet Softw are Configur ation Guide: Getting St arted*.

You apply all STM-1 interface SONET/SDH options to the first E1 interface in the configuration by including the sonet-options statement at the [edit interfaces e1-*fpc*/*pic*/*port*:*channel*] hierarchy level:

```
[edit]
interfaces {
    e1-fpc/pic/port:0 {
        encapsulation cisco-hdlc;
        sonet-options {
            no-z0-increment;
        }
        e1-options {
            framing g704;
        }
        unit 0 {
            family inet {
                address 10.11.30.1/30;
            }
        }
    }
    e1-fpc/pic/port:1 {
        encapsulation frame-relay;
        e1-options {
            framing g704;
        }
        unit 1 {
            dlci 16;
            family inet {
                address 10.11.31.9/30;
            }
        }
    }
```

```
    e1-fpc/pic/port:2 {
        encapsulation ppp;
        no-keepalives;
        unit 0 {
            family inet {
                address 10.11.31.47/30;
            }
        }
    }
}

[edit]
chassis {
    fpc 2 {
        pic 0 {
            vtmapping klm;
        }
    }
}
```